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ABSTRACT

This study examined differences between the positive mother-infant interactions of adolescents and those of young adult mothers, both before and after controlling for socioeconomic status (SES) and educational level. The study also investigated factors related to adolescents' early and later maternal-infant interaction patterns. Subjects were 100 adolescents (aged 13 to 19) and 100 young adults (aged 20 to 29) from a moderate-sized Southeastern city who were interviewed during pregnancy. Maternal-infant observations were conducted at one month using the NCAST Feeding Scale, a 76-item behavioral observation system. At 6 months post-partum, mothers were interviewed, and maternal-infant interactions were observed using the NCAST Teaching Scale, a 73-item behavioral observation system. Results revealed significant group differences for the following factors: (1) ego identity, (2) knowledge about infants and infant care, (3) knowledge of infant competencies, (4) maternal-fetal attachment, (5) post-partum depression, (6) self-esteem, (7) developmentally appropriate home environment, and (8) maternal-infant interactions at 1 and 6 months. However, all differences disappeared after the effects of SES and educational level were controlled. Significant predictors of adolescents' early interactions were pregnancy planning, knowledge of infant competencies, and social support. Predictors of later interactions and home environment were social support and early interactions. (Contains 19 references.) (MM)

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EARLY AND LATER MATERNAL-INFANT INTERACTIONS IN ADOLESCENT MOTHERS: A COMPARISON STUDY

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ABSTRACT

Adolescents demonstrate less positive mother-infant interactions compared to older mothers. This research examined these differences before and after controlling for SES and maternal education. Additionally, factors related to adolescents' maternal-infant interaction patterns were identified. Black and White primiparas adolescents (aged 13-19) and young adults (ages 20-29) were interviewed during pregnancy. Maternal-infant observations were conducted at 1 month and 6 months. Significant group differences were found for ego identity, knowledge about infants and infant care, knowledge of infant competencies, maternal-fetal attachment, post-partum depression, self-esteem, developmentally-appropriate home environment (HOME), and maternal-infant interactions at 1 month and 6 months. All differences disappeared after the effects of SES and maternal education were controlled. Significant predictors of adolescents' early interactions were pregnancy planning, knowledge of infant competencies, and social support. Predictors of the later interactions and home environment were social support and the early interactions.

STATEMENT OF THE PROBLEM

Adolescent pregnancy and parenting have been linked to various problems, including high rates of infant mortality and morbidity, social-economic risks to the family, and developmental risks to the child. Adolescents possess less accurate knowledge about infant development and infant competencies than older mothers (Epstein, 1980; Jarrett, 1982; Miller, 1984; Nickel & Delany, 1985; Roosa & Vaughan, 1984). Moreover, in comparison to older mothers, adolescents demonstrate less positive interactions with their infants, particularly less verbal interaction (Culp, Appelbaum, Osofsky, & Levy, 1988; Jones, Green, & Kraus, 1980; Landy, Clark, Schubert, & Jillings, 1983; Levine, Coll, & Oh, 1985; Roosa, Fitzgerald, & Carson, 1982; Zuckerman, Walker, Frank, Chase, & Hamburg, 1984).

These findings must be interpreted with caution. First, the sample sizes are often small and may be unrepresentative (Landy et al., 1983; Levine et al., 1985). Secondly, often multiple comparisons are made but only the few differences found reported (Levine et al., 1985; Roosa et al., 1982).

Finally, many of the reported age effects may in fact be due to other factors which happen to be concomitant to age of mother. Adolescent samples, by nature, are composed of lower socioeconomic status, less-educated women. On the other

hand, the adult samples are often drawn for convenience and consist of highly-educated women who are middle to upper socioeconomic status (e.g., Culp et al., 1988; Roosa et al., 1982).

In this research project, we attempted to remedy the above problems by having a large sample of adolescent and young adult mothers and by matching these samples as closely as possible on socioeconomic status. Moreover, we analyzed all data with and without maternal education and SES as covariates.

The purpose of this research was threefold:

1. To examine differences between adolescents and a comparison group of young adults on a number of pregnancy and maternal-infant interaction variables;
2. To identity whether these differences, if any, were due to age or due to concomitant factors of socioeconomic status and educational level; and
3. To identify factors related to adolescents' early and later maternal-infant interaction patterns.

SUBJECTS

Subjects for this study were volunteer females aged 13-29 who were expecting their first child. All subjects were in the third trimester of their pregnancy at the beginning of the study. One hundred subjects were 19 years of age or younger (the adolescent group), and the other 100 subjects were 20-29 years of age (the young adult group). Subjects were recruited from childbirth education classes at local hospitals, local maternity clinics and other Health Department programs, obstetricians' offices, public schools, and adolescent pregnancy programs in a moderate-sized Southeastern city.

INSTRUMENTS: PREGNANCY

Six instruments were administered during a third-trimester interview with each subject:

1. **Family/Friend APGAR** (Smilkstein, 1978).
2. **Ego Identity Scale** (Rasmussen, 1964).
3. **Knowledge About Infants and Infant Care** (Myers-Walls, 1977, 1979).
4. **Perception of Caretaking Competence** (Myers-Walls, 1977, 1979).
5. **Maternal-Fetal Attachment Scale** (Cranley, 1979).
6. **Knowledge of Infant Competencies** (Snyder & Eyres, 1979).

Our modified version of the knowledge of infant competencies included five short questions:

1. At what age do you think your baby will start to be aware of his/her surroundings or know what is going on around him/her?

2. At what age do you think your baby will be able to recognize faces and objects clearly?

3. At what age do you think your baby will be able to hear sounds and voices clearly?

4. At what age do you think you will be able to start teaching things to your baby?

5. At what age do you think it will be especially important to talk to your baby?

The score for each item was the actual age given by the subject. An average across the five items was also computed.

INSTRUMENTS: POST-PARTUM I

At 3-5 weeks post-partum, maternal-infant interactions were observed using the NCAST Feeding Scale (Barnard, 1978), a 76-item behavioral observation system. The 50 maternal items are divided into four subscales:

1. Sensitivity to Cues
2. Response to Distress
3. Social-Emotional Growth Fostering
4. Cognitive-Growth Fostering

The 26 infant items are divided into two subscales:

1. Clarity of Cues
2. Responsiveness to Parent

INSTRUMENTS: POST-PARTUM II

At 6 months post-partum, the mothers were interviewed and maternal-infant interactions were again observed. Four instruments were administered during the interview:

1. **Family/Friend APGAR** (Smilkstein, 1978).
2. **Depression Scale** (Radloff, 1981).
3. **Self-Esteem Scale** (Hudson, 1982).
4. **Home Observation for Measurement of the Environment (HOME)** (Caldwell & Bradley, 1984).

Maternal-infant interactions were observed using the NCAST Teaching Scale (Barnard, 1980), a 73-item behavioral observation system. The 50 maternal items are divided into four subscales:

1. Sensitivity to Cues
2. Response to Distress
3. Social-Emotional Growth Fostering
4. Cognitive-Growth Fostering

The 23 infant items are divided into two subscales:

1. Clarity of Cues
2. Responsiveness to Parent

INTERVIEWERS/OBSERVERS

The pregnancy interviews were conducted by the principal investigator, two graduate students, and two former social workers trained by the experimenter, all female. A training session was provided for all interviewers.

Ten trained female observers, including one of the co-investigators, were employed to conduct the post-partum observations. Each of the observers had been previously trained by the Nursing Child Assessment Satellite Training program and had previous experience conducting observations with the NCAST Feeding and Teaching Scales and conducting HOME interviews.

OBSERVER RELIABILITY

Reliability checks (i.e., two observers recording the session) were conducted for about 10% of the NCAST Feeding observations. Observer reliability was calculated using the formula:

$$\frac{\text{\# of Agreements}}{\text{\# of Agreements + Disagreements}}$$

Reliability for the total Feeding scale for all observers combined was .91. Reliability for the six subscales for all observers combined ranged from .86 to .96.

PROCEDURE

All 200 subjects were interviewed during their third trimester. Interviews took place in the subjects' homes, at their school, or at the maternity clinic. In addition to obtaining demographic information and information about their pregnancies, the interviewers administered the six pregnancy instruments.

After the births, information about the labor/delivery and the health of the mother and baby was obtained from the hospital. Any subject whose infant received a 5-minute APGAR less than 7 and/or whose infant was in the Neonatal Intensive Care Unit was excluded from the post-partum observation phase. In addition, if either mother or infant were re-hospitalized during the first 3 weeks

post-partum, the subject was excluded. Seven adolescents and four young adults were excluded.

The remaining subjects were contacted when their infant was 3-5 weeks old. Arrangements were made to visit the home and observe the mother and infant interacting during a feeding session. Some subjects requested to drop out of the study at this phase and other subjects could not be contacted. In all, 73 adolescents and 80 young adults were observed using the NCAST Feeding Scale.

The subjects were again contacted when their infants were 6-7 months old. Arrangements were made to visit the home, interview the mother, and observe the mother and infant interacting during a teaching session. Some subjects could not be contacted or did not wish to be interviewed at this phase. A total of 46 adolescents and 46 young adults were interviewed and observed using the NCAST Teaching Scale.

RESULTS

t-tests and analyses of covariance were used to examine group differences. Due to the number of analyses conducted, alpha was set at .01 for all analyses. The adolescent and young adult groups showed no significant differences on the pregnancy measures of social support and perception of caretaking competence.

The adolescents did demonstrate significantly lower ego identity ($p = .0001$), knowledge about infants and infant care ($p = .0001$), maternal-fetal attachment ($p = .004$), and knowledge of infant competencies ($p = .0001$) during pregnancy. [See Table 1 for group means and standard deviations on all pregnancy measures.]

At the 1-month observation, there was no significant difference between the infants of adolescents and young adult mothers for the infant subscales of the Feeding Scale. However, the adolescents exhibited significantly less positive interactions with their infants on the maternal subscales ($p = .0001$).

At 6 months, as during pregnancy, there was no significant difference between the adolescents and young adults on social support. However, the adolescents showed significantly higher depression ($p = .0074$), a trend toward lower self-esteem ($p = .0154$), and significantly lower HOME scores ($p = .0001$). By 6 months, both infants and adolescents were displaying significantly poorer interactions with each other on the Teaching Scale (Infant subscales: $p = .0128$; Maternal subscales: $p = .0001$). [See Table 2 for group means and standard deviations on all post-partum measures.]

Analyses of covariance were performed for all pregnancy and post-partum measures. When SES and maternal education were used as covariates, all group differences disappeared (see Tables 3 and 4).

Our primary research question dealt with what factors are predictive of adolescents' interactions with their infants. Stepwise regression identified four significant predictors of adolescents' interactions at 1-month. Greater knowledge of infant competencies ($p = .0222$), planning the pregnancy ($p = .0108$), and selecting a pediatrician prior to birth ($p = .0086$) were all associated with more positive maternal-infant interactions. Adolescents indicating more social support had less positive interactions ($p = .0060$).

Stepwise regressions were also used to predict the HOME and the Teaching interaction at 6 months. Social support during the pregnancy was the only significant predictor of the teaching interaction ($p = .0084$). This time the direction was positive -- those adolescents with more social support demonstrated more positive interactions with their infants. There was also only one significant predictor of the HOME interaction -- the maternal interaction at 1 month ($p = .0343$). Adolescents with more positive interactions at 1 month had higher HOME scores at 6 months.

TABLE 1

Means and Standard Deviations: Pregnancy

	Adolescents		Young Adults	
	Mean	SD	Mean	SD
Family/Friend APGAR	42.1	6.2	43.5	5.0
Ego Identity	291.2	29.2	312.9	32.5
Knowledge About Infants & Infant Care	17.2	3.0	19.9	2.5
Perception of Caretaking Competence	120.9	17.6	118.8	17.0
Maternal-Fetal Attachment	96.7	9.0	100.3	8.4
Knowledge of Infant Competencies (in months)	6.0	6.6	2.9	2.7

TABLE 2

Means and Standard Deviations: Post-Partum

	Adolescents		Young Adults	
	Mean	SD	Mean	SD
Maternal-Interaction: 1-month	38.0	7.7	43.4	5.7
Infant-Interaction: 1-month	17.7	3.9	18.7	3.2
Family/Friend APGAR: 6-month	40.2	7.9	42.5	5.6
Depression	18.6	11.0	12.6	9.8
Self-Esteem	32.0	15.0	24.7	13.5
HOME	29.1	6.2	38.0	5.1
Maternal Interaction: 6-month	31.3	5.1	38.2	7.1
Infant Interaction: 6-month	15.2	4.1	17.2	3.7

TABLE 3

Comparison of Analyses With and Without Covariates of SES and Maternal Education: Pregnancy

	p Without	p With
Family/Friend APGAR	.0863	.7456
Ego Identity	.0001	.2710
Knowledge About Infants & Infant Care	.0001	.0432
Perception of Caretaking Competence	.3804	.8519
Maternal-Fetal Attachment	.0040	.2977
Knowledge of Infant Competencies	.0001	.0582

TABLE 4

Comparison of Analyses With and Without Covariates of SES and Maternal Education: Post-Partum

	p Without	p With
Maternal Interaction: 1-month	.0001	.2151
Infant Interaction: 1-month	.0902	.8784
Family/Friend APGAR: 6-month	.1131	.8885
Depression	.0074	.7134
Self-Esteem	.0154	.6960
HOME	.0001	.0151
Maternal Interaction: 6-month	.0001	.1601
Infant Interaction: 6-month	.0128	.0333

CONCLUSIONS

The differences found here between the adolescent and young adult groups cannot be explained by age because the age group differences disappeared when SES and maternal education were covaried. Researchers should use caution when comparing samples of pregnant adolescents with pregnant adults, without controlling for concomitant factors such as SES and maternal education.

Several variables were predictive of the adolescents' early interactions with their infants. Planning was an important predictor as was knowledge of infant competencies. Adolescents who knew that infants were capable of seeing, hearing, and responding to their environment at younger ages predictably interacted more positively with them.

A final predictor was social support: adolescents with less social support had more positive early maternal-infant interactions. This prediction was in the reverse direction than one would expect. However, three-fourths of the adolescents in this sample lived with their mothers. Adolescents experiencing high levels of social support probably had mothers who provided much of the infant care.

This may have adversely affected the adolescents' interactions with their infants in two ways. First, if the grandmother provided the majority of the care

for the infant, the adolescent received little such experience. Second, the grandmother was probably an adolescent mother herself, with the associated poorer maternal-infant interaction skills. She may have provided a highly salient model of poor infant interaction skills.

While high social support was detrimental to early interactions, it was helpful for later interactions. Perhaps supportive grandmothers providing much of the early infant care adversely affects their daughters' early interactions in that the adolescents obtain little such experience. Months later, as the grandmothers relinquish more child care responsibility to their daughters, the adolescents develop better interaction skills.

The early interactions themselves were important predictors of the ability to provide a developmentally-appropriate environment. This, coupled with the fact that by 6 months the adolescents' infants were developing poorer interaction patterns, reinforces the need for early intervention with adolescent mothers.

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